Claims

What is claimed is:

1. A terminal for transporting data packets via radio frames, the terminal comprising:

a. a data packet receiver for receiving data packets for communication over a wireless link wherein not every data packet has a same length;

b. a data packet formatting apparatus coupled to the data packet receiver, the data packet formatting apparatus for formatting the data packets according to radio frames wherein the radio frames each have a same length and wherein the data packets are formatted into the radio frames such that boundaries for the data packets are not necessarily aligned with boundaries for the radio frames; and

c. a wireless transceiver coupled to the packet formatting apparatus, the wireless transceiver for communicating the radio frames over the wireless link.

2. The terminal according to claim 1 wherein the terminal does not convert the Ethernet data packets into a telephony communication protocol or into an asynchronous transfer mode (ATM) protocol prior to communication of the radio frames over the wireless link.

3. The terminal according to claim 1 further comprising a data packet synchronizer coupled to the data packet receiver and to the data packet formatting apparatus for synchronizing the data packets to a clock signal associated with the radio frames.

4. The terminal according to claim 1 wherein the data packets are Fast Ethernet data packets.

5. The terminal according to claim 1 wherein the data packets are time-division multiplexed into the radio frames.

6. The terminal according to claim 1 wherein each radio frame includes a data field having a predetermined length for receiving the data packets.

7. The terminal according to claim 6 wherein the data packets are received by the data packet receiver separated by an inter-packet gap and wherein a code representative of the inter-packet gap is stored in the data field between the data packets.

8. The terminal according to claim 1 wherein the data packet receiver receives the data packets from a local area network coupled to the data packet receiver via a twisted pair of wires.

9. The terminal according to claim 8 wherein the data packets are Fast Ethernet data packets.

10. The terminal according to claim 9 wherein the data packet receiver is an Ethernet switch.

11. The terminal according to claim 10 wherein the Ethernet switch comprises a 100BASE-T port for receiving the data packets from the local area network.

12. The terminal according to claim 11 wherein the Ethernet switch further comprises an MII (media independent interface) for providing the data packets to the packet formatting apparatus.

13. The terminal according to claim 1 wherein the data packet receiver receives the data packets from a local area network coupled to the data packet receiver via a fiber optic cable.

14. The terminal according to claim 1 wherein the radio frames are communicated over the wireless link according to full-duplex communication.

15. A method of transporting data packets via radio frames wherein the method comprises steps of:

a. receiving data packets wherein not every data packet has a same length;

b. formatting the data packets according to radio frames wherein the radio frames each have a same length and wherein the data packets are formatted into the radio frames such that boundaries for the data packets are not necessarily aligned with boundaries for the radio frames; and

c. communicating the radio frames over the wireless link.

16. The method according to claim 15 wherein each radio frame includes a data field having a predetermined length and wherein the step of formatting includes a step of placing the data packets into the data field.

17. The method according to claim 16 wherein the step of receiving data packets comprises a step of receiving an inter-packet gap between each packet.

18. The method according to claim 16 further comprising a step of synchronizing the data packets to a clock signal associated with the radio frames.

19. The method according to claim 17 wherein the step of formatting the data

packets comprises a step of inserting a code representative of an inter-packet gap into radio frames between each data packet.

20. The method according to claim 15 wherein the step of receiving the data packets comprises a step of receiving the data packets from a local area network via a twisted pair of wires.

21. The method according to claim 15 further comprising a step of mapping portions of the radio frame to quadrature amplitude modulation symbols.

22. The method according to claim 15 wherein the step of formatting the data packets according to radio frames includes a step of time-division multiplexing the data packets into the radio frames.

23. The method according to claim 20 wherein the data packets are Fast Ethernet data packets.

24. The method according to claim 23 wherein the method does not include a step of converting the data packets into a telephony communication protocol or into an asynchronous transfer mode (ATM) protocol prior to communication of the radio frames over the wireless link.

25. The method according to claim 15 further comprising steps of:

a. receiving the radio frames from the wireless link; and

b. reconstructing the data packets from received radio frames.

26. A method of transporting data packets via radio frames wherein the method

comprises steps of:

a. receiving data packets wherein not every data packet has a same length and wherein each data packet is separated by an inter-packet gap;

b. formatting the data packets according to radio frames wherein each radio frame includes a data field having a predetermined length and wherein the data packets are formatted into each data field one after the other wherein each data packet is separated from its neighbors by a code representative of an inter-packet gap and wherein boundaries for the data packets are not necessarily aligned with boundaries for the radio frames such that the data packets are time-division multiplexed into the radio frames; and

c. communicating the radio frames over the wireless link.

27. The method according to claim 26 wherein the data packets are Fast Ethernet packets.

28. The method according to claim 26 further comprising a step of synchronizing the data packets to a clock signal associated with the radio frames.

29. The method according to claim 27 wherein the method does not include a step of converting the data packets into a telephony communication protocol or into an asynchronous transfer mode (ATM) protocol prior to communication of the radio frames over the wireless link.

30. The method according to claim 27 wherein the code representative of an inter-packet gap is representative of an inter-packet gap of approximately of 0.96 μs.

31. A method of transporting Fast Ethernet data packets via radio frames over a

wireless link, the method comprising steps of:

a. receiving Fast Ethernet data packets into a receiver from a first local area network via a twisted pair of wires;

b. formatting the data packets according to radio frames wherein the radio frames each have a same length and wherein the Fast Ethernet data packets are formatted into radio frames such that boundaries for the Fast Ethernet packets are not necessarily aligned with boundaries for the radio frames;

c. communicating the radio frames over the wireless link;

d. receiving the radio frames from the wireless link;

e. reconstructing the Fast Ethernet data packets from received radio frames; and

f. communicating reconstructed Fast Ethernet data packets to a second local area network.

32. The method according to claim 31 wherein each radio frame includes a data field having a predetermined length and wherein the step of formatting includes a step of placing the data packets into the data field.

33. The method according to claim 31 wherein the step of formatting the data packets according to radio frames includes a step of time-division multiplexing the data packets into the radio frames.

34. The method according to claim 31 further comprising a step of synchronizing the data packets to a clock signal associated with the radio frames.

35. The method according to claim 31 wherein the method does not include a step of converting the data packets into a telephony communication protocol or into an asynchronous transfer mode (ATM) protocol prior to communication of the radio frames over

the wireless link.

36. A terminal for transporting data packets via radio frames, the terminal comprising:

a. a data packet receiver for receiving data packets for communication over a wireless link wherein not every data packet has a same length;

b. a packet formatting apparatus coupled to the data packet receiver, the packet formatting apparatus for formatting the data packets according to radio frames wherein the packet formatting apparatus comprises:

i. means for performing forward error correction on data from the data packets thereby forming error corrected data;

ii. means for inserting the error corrected data into radio frames; and

iii. means for randomizing data within the radio frames; and

c. a wireless transceiver coupled to the packet formatting apparatus, the wireless transceiver for communicating the radio frames over the wireless link.

37. The terminal according to claim 36 wherein the data packets are Fast Ethernet data packets.

38. The terminal according to claim 37 wherein the radio frames each have a same length and wherein the packet formatting apparatus formats the data packets into the radio frames such that boundaries for the data packets are not necessarily aligned with boundaries for the radio frames.

39. The terminal according to claim 38 further comprising a data packet synchronizer coupled to the data packet receiver and to the data packet formatting apparatus for synchronizing the data packets to a clock signal associated with the radio frames.

40. The terminal according to claim 37 wherein the terminal does not convert the Ethernet data packets into a telephony communication protocol or into an asynchronous transfer mode (ATM) protocol prior to communication of the radio frames over the wireless link.

41. The terminal according to claim 37 wherein the data packets are time-division multiplexed into the radio frames.

42. The terminal according to claim 37 further comprising a data packet synchronizer coupled to the data packet receiver and to the data packet formatting apparatus for synchronizing the data packets to a clock signal associated with the radio frames.

43. The terminal according to claim 37 wherein the packet formatting apparatus further comprises means for mapping portions of the radio frame to quadrature amplitude modulation symbols.

44. The terminal according to claim 37 wherein the radio frames are communicated over the wireless link according to full-duplex communication.

45. A method of transporting Ethernet data packets via radio frames, the method comprising steps of:

a. receiving Ethernet data packets wherein each data packet includes a data valid bit for each portion of packet data; and

b. removing each data valid bit.

46. The method according to claim 45 further comprising steps of:

a. formatting the Ethernet data packets according to radio frames after performing

the step of removing each data valid bit; and

b. communicating the radio frames over a wireless link.

47. The method according to claim 46 wherein each portion of packet data is four bits long.

48. The method according to claim 46 wherein the radio frames each have a same length and wherein the step of formatting the data packets according to radio frames is performed such that boundaries for the data packets are not necessarily aligned with boundaries for the radio frames.

49. The method according to claim 46 further comprising a step of synchronizing the data packets to a clock signal associated with the radio frames.

50. The method according to claim 46 wherein the step of formatting the data packets according to radio frames includes a step of time-division multiplexing the data packets into the radio frames.

51. A method of transporting Ethernet data packets via radio frames, the method comprising steps of:

a. receiving Ethernet data packets wherein each data packet includes a preamble and a start-of-frame delimiter;

b. stripping off the preamble and start-of-frame delimiter;

c. formatting the packet data according to radio frames wherein the step of formatting includes steps of:

i. appending a synch field to the packet data; and

ii. appending a length field to the packet data.

52. The method according to claim 51 further comprising a step of inserting a synch value which is in accordance with a Willard code into the synch field.

53. The method according to claim 51 further comprising a step of inserting a length value and an error correcting code for correcting errors in the length value into the length field.

54. The method according to claim 53 wherein the error correcting code is a Golay error correcting code.

55. The method according to claim 51 wherein the radio frames each have a same length and wherein the step of formatting the data packets according to radio frames is performed such that boundaries for the data packets are not necessarily aligned with boundaries for the radio frames.

56. The method according to claim 51 further comprising a step of synchronizing the data packets to a clock signal associated with the radio frames.

57. The method according to claim 51 wherein the step of formatting the data packets according to radio frames includes a step of time-division multiplexing the data packets into the radio frames.

58. The method according to claim 56 wherein the step of synchronizing comprises steps of:

a. storing each portion of packet data in successive locations of a buffer; and

b. removing the packet data from the packet buffer prior to performing the step of formatting.

59. The method according to claim 58 wherein the radio frames each have a same length and wherein the step of formatting the data packets according to radio frames is performed such that boundaries for the data packets are not necessarily aligned with boundaries for the radio frames.

60. The method according to claim 51 wherein each data packet includes a data valid bit for each portion of packet data and wherein the method further comprises a step of removing the data valid bit for each portion of packet data.

61. The method according to claim 60 wherein each portion of packet data is four bits long.

62. The method according to claim 60 further comprising steps of:

a. storing the each portion of packet data in successive locations of a buffer; and

b. removing the packet data from the packet buffer prior to performing the step of formatting.

63. The method according to claim 60 further comprising a step of storing the data valid bit for each portion of packet data in association with the four bit portion of packet data.

64. The method according to claim 60 wherein the radio frames each have a same length and wherein the step of formatting the data packets according to radio frames is performed such that boundaries for the data packets are not necessarily aligned with boundaries for the radio frames.

65. The method according to claim 51 further comprising a step of communicating the radio frames over the wireless link according to full-duplex communication.